



## SUMITOMO PRODUCT SPECIFICATION

**FutureFLEX®**

**TCxxTP2-1 PLENUM RATED TUBE CABLE SERIES (NFPA 262)  
WITH GALVANIZED STEEL INTERLOCKED ARMORING**



SUMITOMO ELECTRIC LIGHTWAVE CORP.

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SEL is a Member of the Sumitomo Electric Industries, Ltd. Group

*Sumitomo Electric Lightwave reserves the right to improve or modify these specifications without notice.*

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## 1.0 GENERAL

This specification covers the design requirements and performance standards for FutureFLEX® Air-Blown Fiber® (ABF) interlocking galvanized steel armored, plenum rated, jacketed tube cables. These tube cables are designed for indoor tube cable infrastructures. The features described in this document are intended to provide information on the performance of Sumitomo Electric's FutureFLEX® tubes and aid in handling and use.

### 1.1 Tube Cable Description

Sumitomo's FutureFLEX® TP2-1 series tube cables are designed for use as an optical fiber cabling infrastructure in ABF applications that require an OFNP fire rating plus armored protection. TP2-1 series tube cables are NFPA 262 listed. TP2-1 series tube cables may also be used in indoor applications where: 1) lesser fire ratings such as Optical Fiber Conductive Riser (OFNR) or Optical Fiber Conductive General Purpose (OFCG) apply or 2) no fire ratings apply but armored protection is required. The individual tubes have a 5.5 mm inside diameter and an 8 mm outside diameter, where the tubes and jacket are comprised of plenum rated PVC material. The outer jacket of the core is grey. The tube cable core is encased in a galvanized steel interlocked armor with no outer jacket. These tube cables are pulled or placed in indoor routes for the purpose of individual tube interconnection to establish pathways for FutureFLEX® fiber bundle installation. A ripcord is provided to aid in outer jacket removal.

### 1.2 Quality

Sumitomo ensures a continuing high level of quality through ISO / TL9000 registered Quality Management Systems and our commitment to continuous improvement. Guaranteed, high quality products have been manufactured at Sumitomo's facility in Research Triangle Park, North Carolina since 1984.

### 1.3 Reliability

Sumitomo ensures product reliability through rigorous qualification testing of each product family to meet or exceed industry standards. Both initial and periodic qualification testing are performed to assure the tube cables' performance and durability in a field environment.

Sumitomo supports industry standards organizations such as Telcordia, Telecommunications Industry Association (TIA), International Telecommunications Union (ITU), International Electrotechnical Commission (IEC), American Society for Testing and Materials (ASTM), Rural Utilities Service (RUS), The Institute of Electrical and Electronics Engineers (IEEE), and Insulated Cable Engineers Association (ICEA).

**2.0 TUBE CABLE DESIGN**

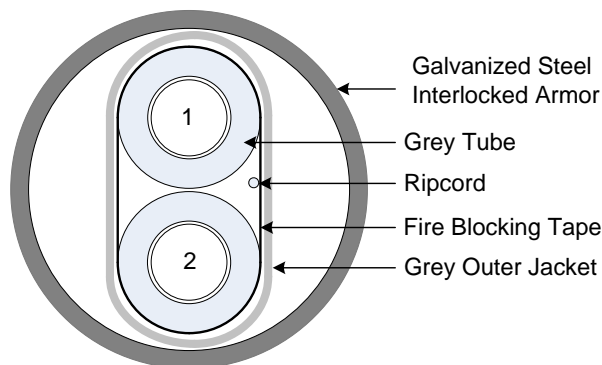
**2.1 General**

Sumitomo's FutureFLEX® TP2-1 series tube cables provide a small diameter, lightweight, indoor pathway for FutureFLEX® fiber bundle installations. FutureFLEX® ABF fiber bundles are available in Single-mode OS1, 62.5 micron Multimode OM1, 1-Gigabit 50 micron Multimode OM2, Laser Optimized 10-Gigabit 50 micron Multimode OM3, and Laser Optimized 10-Gigabit 50 micron Multimode OM4 versions with 2, 4, 6, 12, 18, or 24 fiber strand counts. One fiber bundle can be field-installed in each tube.

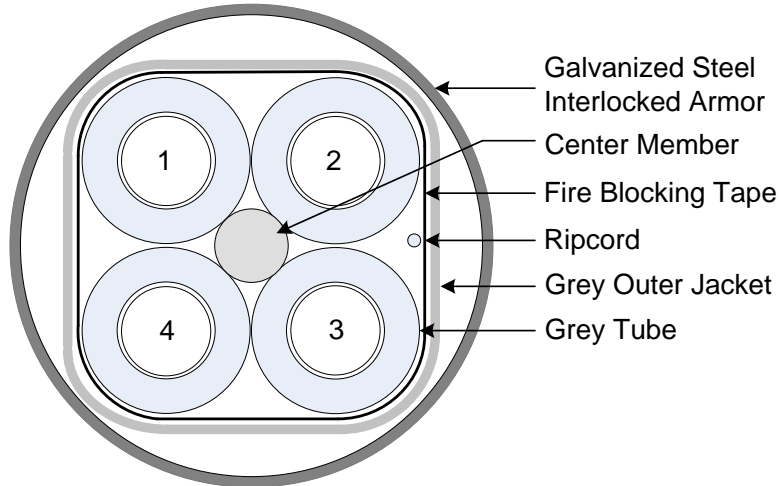
**2.2 Construction**

SEL Part Number	Product Description	Outside Diameter (in.)	Max. Weight (lbs. / ft.)	Max. Tensile Load (lbs.)
TC02TP2-1	2- Plenum rated tubes, fire blocking tape, ripcord, jacketed, galvanized steel interlocking armor	1.07	.502	500
TC04TP2-1	4- Plenum rated tubes, center member, fire blocking tape, ripcord, jacketed, galvanized steel interlocking armor.	1.17	.608	500
TC07TP2-1	7- Plenum rated tubes, fire blocking tape, ripcord, jacketed, with a galvanized steel interlocking armor.	1.37	.887	600
TC19TP2-1	19- Plenum rated tubes, fire blocking tape, ripcord, jacketed, with a galvanized steel interlocking armor.	2.02	1.541	600

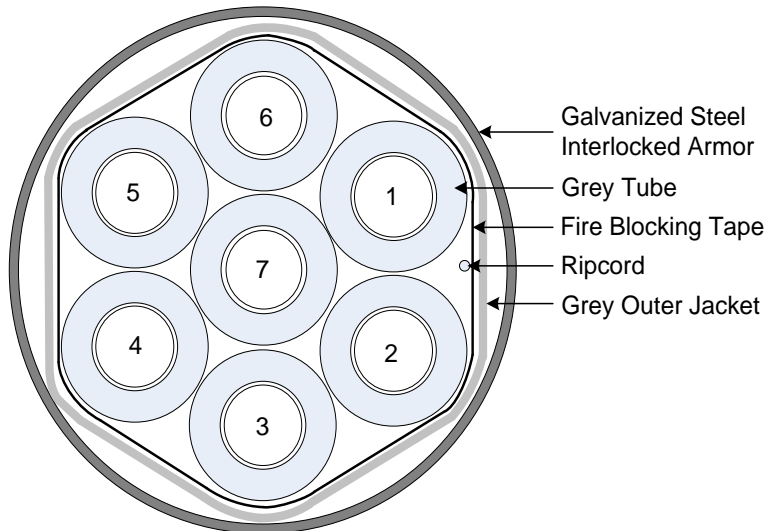
Drawings Are Not To Scale



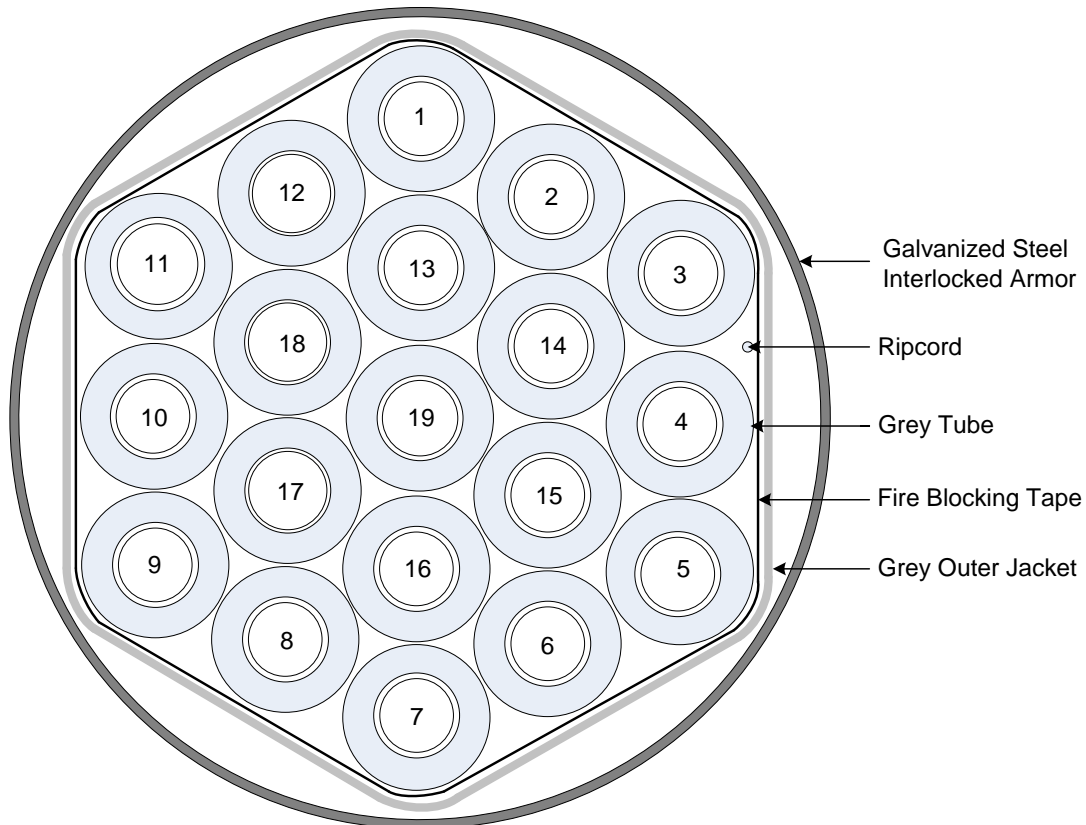
2-Tube  
Interlocked Armor /  
Plenum Rated  
TC02TP2-1



4-Tube  
Interlocked Armor /  
Plenum Rated  
TC04TP2-1



7-Tube  
Interlocked Armor /  
Plenum Rated  
TC07TP2-1



19-Tube  
Interlocked Armor /  
Plenum Rated  
TC19TP2-1

### 3.0 TUBE CABLE CHARACTERISTICS

#### 3.1 Performance

Property	Specification
Operation Temperature Range	+32° to +158° F (per ICEA 596)
Minimum Bend Radius (During / After Installation)	20 / 10 x tube cable outside diameter

#### 3.2 Tube and Jacket Markings

The outside surface of each tube in multi-tube configurations is marked every two inches with a tube designation number (1 through 19).

In accordance with UL requirements, the outside surface of each cable jacket, under the armoring, is marked every two (2) feet with the following product identification information:

**'Phone receiver' SEL FutureFLEX® (SEL Part No.) Type OFNP (UL) c(UL) E146200 Field Assembled Optical Fiber Cable CSA 238147 OFN FT6-(Manufacturing Lot #-) (Sequential footage) 1-877-356-FLEX [WWW.FUTUREFLEX.COM](http://WWW.FUTUREFLEX.COM) ←**

#### 3.3 Reel Markings

The outside of each reel flange is marked with the Sumitomo Electric Lightwave Corp. product part number, the tube cable manufactured length in feet, and the text "Do Not Lay Flat."

#### 3.4 Tube Cable Ends

Both ends of the tube cable are accessible on the reel. Each tube is sealed with a plastic cap or plug. Tube cable ends are sealed with a heat shrink end cap.

#### 3.5 Tube Cable Reel Data

Sumitomo Part No.	Reel Length (ft)	Reel F x W (in)	Minimum Drum Diameter (in)	Reel Weight (lbs) Empty	Reel Weight (lbs) Full
TC02TP2-1	1000	60 x 39	30	410	912
TC04TP2-1	1000	60 x 39	30	410	1090
TC07TP2-1	1000	60 x 39	30	410	1264
TC19TP2-1	1000	72 x 49	36	652	2197

#### Notes:

- TCxxTP2-1 Armored Plenum Tube Cable Designs are only available in 1,000-foot Reel Lengths.
- Reel Length tolerances are  $\pm 5\%$ .
- Cut Lengths are available. Contact FutureFLEX® Distributor for additional information.
- If tube cable is re-spooled, the minimum Drum Diameter of the new reel SHALL be no less than that specified herein to avoid damaging tube cable product.
- All Reel Widths shown are approximate values only and measured from outside-of-flange to outside-of-flange plus an allowance for fastener hardware protrusions.
- All Empty and Full Reel Weights shown are approximate values only.

#### 4.0 TESTING

Each finished tube cable is required to pass a 4.5mm diameter steel ball from end to end using 70 psi (+/- 10 psi) gas pressure.

#### 5.0 INSTALLATION / HANDLING PRACTICES

Sumitomo has incorporated a wide range of technical support and training services for our tube cable products into our Technical Support Services (TSS) program. TSS offers training in the areas of cable installation, sheath entry, splicing, testing, and system troubleshooting. The services are available in a variety of media formats and can be customized to better accommodate individual training needs. The TSS program consists of an extensive series of recommended procedure documents, training courses with classroom and hands-on instruction. Please contact Sumitomo's Customer Service department for more information.

#### 6.0 ORDERING INFORMATION

To learn more about Sumitomo's cables or to place an order, call, fax, e-mail, or write us at:

##### SUMITOMO ELECTRIC LIGHTWAVE CORPORATION

201 South Rogers Lane

Suite 100 Raleigh, NC 27610

Attn: Customer Service Department

Phone: 800-358-7378

919- 541-8100

Fax: 919- 541-82265

E-mail: [info@sumitomoelectric.com](mailto:info@sumitomoelectric.com)

Sumitomo Electric Lightwave reserves the right to improve, enhance, or modify the cable's features and specifications. For special requirements different than those shown above, please contact our Inside Sales Department. Each Sumitomo Electric Lightwave Corp. optic cable and/or its manufacture may be covered by one or more of the following US Patents: 4,715,677 4,729,629 4,763,983 4,770,489 4,828,349 4,953,945 5,043,037 5,082,347 5,165,003 D331,567 5,247,599 5,410,901 5,471,555 5,642,452.